CLAIMS

Having thus described the invention, what is claimed is:

1. A method of managing workload on a system comprising a plurality of resources each capable of supporting one or more virtual machines and at least one shared storage location, comprising the steps of:

calculating the number of needed resources required to support the current workload based on the total utilization of the resources currently powered on;

ascertaining the number of the available resources within said system;

determining the relationship between the number of needed resources and the number of available resources; and

performing steps to migrate at least one virtual machine from at least one physical resource to at least

one other physical resource based on the relationship.

2. The method of Claim 1 wherein said performing comprises instructing at least one virtual machine to migrate from its respective one of said plurality of available resources by halting processing at its respective one of said plurality of available resources, copying its entire state to said storage location, and resuming processing in at least one different resource of said plurality of available resources.

3. The method of Claim 2 further comprising powering down at least one of said available resources from which said at least one virtual machine has been migrated after said copying when it is determined that the number of available resources exceeds the number of needed resources.

4. The method of Claim 2 wherein said at least one different resource of said available resources had been powered down and additionally comprising the step of powering up said at least one different resource prior to said resuming of processing.

5. The method of Claim 1 wherein said calculating the

number of needed resources required to support the current workload comprises determining a utilization amount for each of the resources currently powered on and adding the utilization amounts together.

6. The method of Claim 2 wherein said calculating the number of needed resources required to support the current workload comprises determining a utilization amount for each of the resources currently powered on and adding the utilization amounts together.

7. The method of Claim 5 wherein the number of needed resources required to support a given workload as represented by a given total utilization is determined to be the smallest integral number larger than the total utilization.

8. The method of Claim 6 wherein the number of needed resources required to support a given workload as represented by a given total utilization is determined to be the smallest integral number larger than the total utilization.

9. A program storage device readable by machine

tangibly embodying a program of instructions executable by the machine for performing a method for managing workload on a system comprising a plurality of resources each capable of supporting one or more virtual machines and at least one shared storage location, said method comprising the steps of:

calculating the number of needed resources required to support the current workload based on the total utilization of the resources currently powered on;

ascertaining the number of the available resources within said system;

determining the relationship between the number of needed resources and the number of available resources; and

performing steps to migrate at least one virtual machine from at least one physical resource to at least one other physical resource based on the relationship.

10. The program storage device of Claim 9 wherein said

performing comprises instructing at least one virtual machine to migrate from its respective one of said plurality of available resources by halting processing at its respective one of said plurality of available resources, copying its entire state to said storage location, and resuming processing in at least one different resource of said plurality of available resources.

11. The program storage device of Claim 10 wherein said method further comprises powering down at least one of said available resources from which said at least one virtual machine has been migrated after said copying when it is determined that the number of available resources exceeds the number of needed resources.

12. A processing workload management system comprising:

multiple physical resources capable of supporting one or more virtual machines; and

at least one power management component adapted to calculate the number of needed resources required to support the current workload based on the total utilization of the resources currently powered on, ascertain the number of the available resources within said system, determine the

relationship between the number of needed resources and the number of available resources; and perform steps to migrate at least one virtual machine from at least one physical resource to at least one other physical resource based on the relationship.

13. The processing workload management system of Claim 12 wherein said power management component instructs at least one virtual machine to migrate from its respective one of said plurality of available resources by halting processing at its respective one of said plurality of available resources, copying its entire state to said storage location, and resuming processing in at least one different resource of said plurality of available resources.

14. The processing workload management system of Claim 12 wherein said power management component further instructs powering down at least one of said available resources from which said at least one virtual machine has been migrated after said copying when it is determined that the number of available resources exceeds the number of needed resources.

15. The processing workload management system of Claim 12 wherein each of said multiple physical resources

additionally comprises a resource power control component for dynamically adjusting power consumption by said physical resource.

16. The processing workload management system of Claim 15 wherein said power management component instructs said resource power control component of at least one of said multiple physical resources to adjust its power consumption.

17. The processing workload management system of Claim 13 wherein said power management component further instructs powering up of at least one resource of said available resources which had been powered down prior to said resuming of processing.

18. A power management component for managing workload on a system comprising a plurality of resources each capable of supporting one or more virtual machines and at least one shared storage location comprising:

a calculating component for calculating the number of needed resources required to support the current workload based on the total utilization of the resources currently powered on;

a detecting component for detecting the number of the

available resources within said system;

a comparator component for determining the relationship between the number of needed resources and the number of available resources; and

a migration instruction component for performing steps to migrate at least one virtual machine from at least one physical resource to at least one other physical resource based on the relationship.

19. The power management component of Claim 18 wherein said migration instruction component instructs at least one virtual machine to migrate from its respective one of said plurality of available resources by halting processing at its respective one of said plurality of available resources, copying its entire state to said storage location, and resuming processing in at least one different resource of said plurality of available resources.

20. The power management component of Claim 18 wherein said migration instruction component further instructs powering down at least one of said available resources from which said at least one virtual machine has been migrated after said copying when it is determined that the number of available resources exceeds the number of needed resources.